Iwao HINO* and Ken KATUMOTO*: The genus *Melchioria* of Japan

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Two species of the bambusicolous fungi of the genus *Gibbera*, *G. maeshimana* Hino et Katumoto and *G. philippinensis* Rehm, were previously described and illustrated from Japan by the present writers in 1961. These fungi, however, have been shown to possess doubtlessly unitunicate asci, and seemed not to be included in the genus *Gibbera* Fr. which had bitunicate asci.

Another related fungus was later found by the writers in Japan, and the fungus in question seemed to be a new species of the genus *Melchioria*. After due reconsideration these three species of the fungi are here taxonomically discussed and described anew by making reference to foreign species of the genus *Melchioria*.

Principal characteristics of the fungi The principal characteristics of the fungi in question, *G. maeshimana*, *G. philippinensis* and another related one, are to be summarized as follows:—The hypostromata are developed in the subcuticular portion of the culm or the leaf-sheath, erumpent and finally exposed, sparse or densely gregarious, usually thin, sometimes pulvinate, pseudoparenchymatous, and light brownish in colour. The perithecia are seated on the surface of the hypostroma, solitary or gregarious, sometimes confluent, globose to depressively globose, sometimes concave at the apical portion, coriaceous, pseudoparenchymatous, blackish brown, and opening with the ostioles at the apex. The ostioles are rotundate and bearing numerous filiform periphyses. The asci are divergent from almost all inner surface of the perithecial wall, clavate, unitunicate, without distinct structure at the apical portion, and with numerous filiform paraphyses. The ascospores are usually biseriate, oblong to fusiform, 1-septate, constricted or not constricted at the septum, rounded at both ends, hyaline, and finely punctate at the epispore in highly matured condition. The bristles are divergent from hypostromata and perithecia, linear, simple, septate, erect or somewhat curved, and brownish.

Taxonomical discussion The subcuticular hypostromata and the superficial perithecia with bristles of these fungi are somewhat similar to those of the genus

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Gibbera Fr. and its allied genera. The asci of these fungi, however, are distinctly unitunicate and the fungi are not to be included in the genus *Gibbera* which has bitunicate asci and belongs to the family Venturiaceae of Pseudosphaeriales.

G. maeshimana is highly similar to *Eriosphaeria calospora* Speg. in respect to the pulvinate hypostromata, apically depressed perithecia and the shape of ascospores, and both fungi are parasitic to the culms of bamboos. *E. calospora* was fully discussed by F. Petrak, and a new genus *Gaeumannia* was established by him for the fungus. The genus *Gaeumannia* Petrak was later again discussed by E. Müller along with the fungi belonging to the genus *Eriosphaeria* Sacc. The genus *Gaeumannia* was at that time regarded to be monotypic and shown to possess a certain relationship to Diaporthales in respect to the reflecting ring-like apparatus which was visible at the apical portion of younger asci. The genus, however, was recognized by E. Müller and J. A. von Arx as a synonym with the genus *Melchioria* Penzig et Sacc. in the family Sphaeriaceae of Sphaeriales, and the apical apparatus of asci of *G. calospora* (Speg.) E. Müller was then described by them to be thin plate-like. Another genus *Exomassarinula* Teng, which was parasitic on *Bambusa* in China, was also included in the genus *Melchioria* by the same authors, and *E. calospora* the Teng, the type species of this genus, was renamed as *Melchioria tengii* E. Müller. The characteristics of the genus *Exomassarinula* considerably coincided with those of the genus *Gaeumannia* except for the hyaline gelatinous sheath of ascospores in the former genus. In this case, presence or absence of the gelatinous sheath of ascospores is not so important to classify the genera, and both genera, *Gaeumannia* and *Exomassarinula*, seem to be synonymous to each other as mentioned by Müller and von Arx.

The writers' fungi seem to also belong to the same genus with the fungi of the genera *Gaeumannia* and *Exomassarinula* in all respects of morphology. The genus *Melchioria*, with which the genera *Gaeumannia* and *Exomassarinula* have been shown to be synonymous by Müller and von Arx, was established by Penzig and Saccardo by taking *M. leucomelaena* as the type species which was found on the leaf-sheaths of Zingiberaceous plants in Java. The writers' fungi seem to be somewhat different from *M. leucomelaena* in respect to the characters of stroma. The stroma of the latter fungus seems to be rather subepidermal by nature, then erumpent and superficially pulvinate over the cuticular of the host, and penetrating into the epidermal and parenchymatous cells of the host tissue. In spite of this slight difference of the character of stroma, the writers' fungi are to be included in the genus *Melchioria* just as *Gaeumannia calospora* and *Exomassarinula calospora* were similarly done by Müller and von Arx, because the difference was considered to be not so essential, but probably due to the different condition of host tissue. The genus *Melchioria* then contains six species of fungi, among which five species are parasitic to the culms or leaf-sheaths of bamboos, excepting the type species.

The key to the bambusicolous species of the genus *Melchioria* seems to be arranged as follows according to the characters of ascospores.

1. { Ascospores with gelatinous sheath………………*M. tengii* E. Müller (China)
   Ascospores without gelatinous sheath………………………………………… 2
2. { Ascospores fusiform, constricted at the septum ………………………………… 3
   Ascospores oblong, not constricted at the septum……………………………… 4
3. { Ascospores 6-12 μ in width……*M. calospora* (Speg.) E. Müller (S. America)
   Ascospores 5-6.5 μ in width……………………………………… *M. maeshimana*
4. { Ascospores 3-4 μ in width……………………………………… *M. philippinensis*
   Ascospores 4-5 μ in width………………………………………… *M. pseudosasae*

1. **Melchioria maeshimana** (Hino et Katum.) Hino et Katumoto, comb. nov.

Gibbera maeshimana Hino et Katumoto, in Hino, Icon. Fung. Bamb. Jap.: 135, 1961——Hino & Katumoto, Bull. Fac. Agr. Yamag. Univ. **12**: 158, 1961.

The hypostromata are scattered or gregarious, subcuticular, pulvinate, light brownish in colour, and 250-300 μ in diameter. The perithecia are superficially seated on the stromata, solitary or 2-4 cespitose, globose, depressed or sometimes slightly concave at the apical portion, frequently setose, 200-270 μ in diameter and 180-220 μ in height. The perithecial wall is pseudoparenchymatous, coriaceous, dark brownish, 15-20 μ in thickness, composed of the cells which are polygonous, isometric and 6-8 μ in diameter. The ostioles are papillate, opening with round pore, 25-35 μ in diameter, and bearing numerous periphyses through the canalate portion. The bristles are linear, erect or slightly curved, simple, septate, dark brown, and 130-200×8-12 μ. The asci are clavate, obtuse and containing thin plate-like apparatus at the apex, attenuate toward the basal portion, with short stipes, containing eight ascospores in two rows, and 65-84×14.5-18 μ. The paraphyses are filiform, rather mucilaginous, and 70-100×1-1.5 μ. The ascospores are fusiform, 1-septate at the middle portion, constricted at the septum, obtuse at both ends, hyaline, finely punctate in quite matured condition, and 22.5-35.5×5-6.5 μ.

Hab. on the culms and leaf-sheaths of *Pleioblastus simoni* Nakai. Nagahara, Gotenba City, Prov. Suruga (1960. 8. 7. H. Muroi—Type).

The fungus seems to be related to *M. calospora* (Speg.) E. Müller [*Gaeumannia calospora* (Speg.) Petrak], but obviously differs from the latter species. The asci of *M. calospora* frequently contain only four ascospores and have rather longer stipes than that of *M. maeshimana*. The dimension of the ascospores of *M. calospora* were described to be 19-34×6-12 μ, and larger in width than that of *M. maeshimana*.

The specific epithet of this species implied Mr. Kazutsugu Maeshima, the owner of "Fuji Bamboo Garden" in Gotenba City.

2. **Melchioria philippinensis** (Rehm) Hino et Katumoto, comb. nov.

Gibbera philippinensis Rehm, Leafl. Philipp. Bot. **8**: 2946, 1916—Saccardo, Syll. Fung. **24**: 923, 1928—Hino, Icon. Fung. Bamb. Jap.: 136, 1961.

The hypostromata are subcuticular, gregarious, pulvinate, thin, effuse, light brownish in colour, and up to 1 mm in diameter. The perithecia are superficially seated on the stroma, gregarious and cespitose, globose, depressed at the apical portion, setose, 200-230 μ in diameter and 130-180 μ in height. The perithecial wall is pseudoparenchymatous, coriaceous, blackish brown, 15-20 μ in thickness, and composed of the cells which are polygonous, isometric, and 7-8 μ in diameter. The ostioles are papillate, opening with pore at the apex, 40-50 μ in diameter, and bearing numerous periphyses through the canalate portion. The bristles are divergent from perithecia and hypostromata, linear, erect or slightly curved, rounded at the apex, septate, dark brownish, and 170-230×8-10 μ. The asci are clavate or cylindrical clavate, obtuse or somewhat rounded at the apex, containing thin plate-like apical apparatus, attenuate toward the basal portion, with short stipes, containing eight ascospores in two rows, and 48-80×10-13 μ. The paraphyses are filiform, somewhat mucilaginous, 60-100×1.5-2 μ. The ascospores are oblong, 1-septate at the middle portion, not constricted, rounded at both ends, frequently slightly curved and somewhat inaequilateral, hyaline, and 15.5-22×3-4 μ.

Hab. on the culms of *Phyllostachys makinoi* Hayata. Nagahara, Gotenba City, Prov. Suruga (1960. 7. 29. H. Muroi).

The fungus is said to also parasitize *Schizostachyum* sp. in the Philippines.

3. **Melchioria pseudosasae** Hino et Katumoto, sp. nov.

Hypostromatibus subcuticularibus, valde tenuiterque effusis, mox erumpentibus, brunneis, 15-20 μ crassis, setulosis; peritheciis superficie sitis ad stromate, gregariis, saepe conjunctis, globosis, apice papillato ostiolatis, pauci setulosis, 150-250 μ diam.;

contextu coriaceo, pseudoparenchymatico, atro-brunneo, 20–25 μ crasso, ex cellulis polyhedricis, isodiametricis et 4–8 μ in diam. composito; setulis linearibus, simplicibus, rectis vel curvatis, apice obtusis, septatis, fusco-brunneis, 80–120×5–12 μ; ascis clavatis, apice obtusis, stipitatis, octosporis, 48–65×9–11 μ; paraphysibus numerosis, filiformibus, mucilagineis, 1.5–2 μ crassis; ascosporidiis distichis, oblongis, plerumque paulum inaequilateraliter curvatis, medio 1-septatis, non constrictis, apice utrinque rotundatis, hyalinis, guttatis, 15–17×4–5 μ.

Hab. in vaginis foliorum *Pseudosasae japonicae* Makino. Ins. Sasima, Urbs Tokuyama, Prov. Suô (1962. 7. 24. I. Hino—Typus in Yamaguti Univ.).

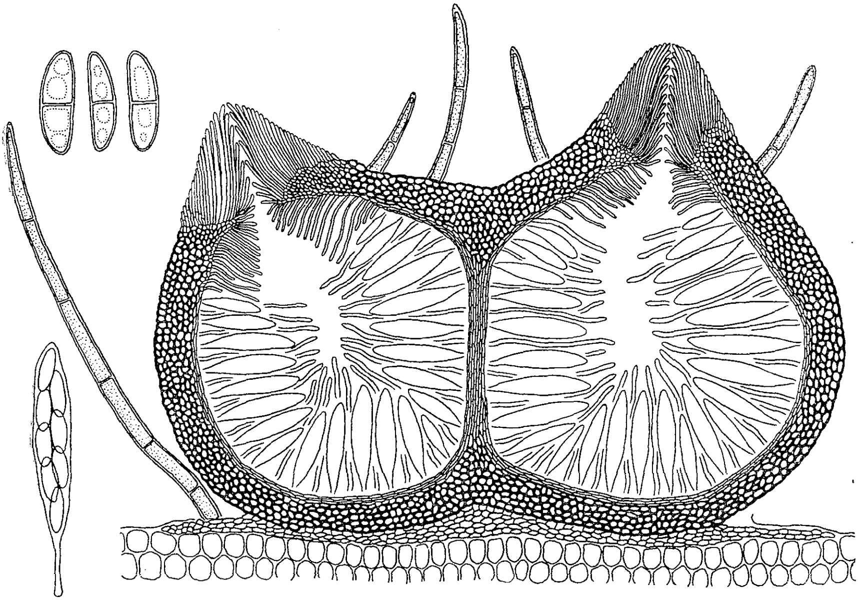

Fig. 1. *Melchioria pseudosasae:* perithecia ×250, ascus ×600 and ascospores ×900.

The hypostromata are subcuticular, thin, 0.5–1 mm in diameter, but frequently widely spread out and up to 5 mm or more in diameter, light brownish, and 15–20 μ in thickness. The perithecia are seated on the stromata, globose, gregarious or cespitose, sometimes conjugate, papillately ostiolate at the apex and bearing numerous periphyses through the canalate portion, and 150–250 μ in diameter. The perithecial wall is coriaceous, pseudoparenchymatous, blackish brown, 20–25 μ in thickness, and composed of the cells which are polygonous, isometric and 4–8 μ in diameter. The inner portion of the perithecial wall is made of flattened and hyaline cells. The bristles are divergent from hypostromata and perithecia, erect or slightly curved, simple, septate, brownish, and 80–120×5–12 μ. The asci are divergent from almost all portions of inner surface of the perithecia, clavate, obtuse at the apex, attenuate toward the basal portion, with short stipes, and 48–65×9–11 μ. The apical apparatus of the ascus is reflecting ring-like at younger stage of ascus, then becomes inconspicuous and remains as thin plate-like structure at the matured stage of ascus. The reflecting ring-like apical apparatus of younger asci was also described by E. Müller in case of *M. calospora*. The ascospores are oblong, 1-septate at the middle portion, not constricted, rounded at both ends, frequently curved and somewhat inaequilateral, hyaline, and 15–17×4–5 μ. The epispore of the ascospores of this fungus has not yet been observed to be punctate though the finely punctate epispore, which is a distinct characteristic of the genus *Melchioria*, was already clearly shown.

The present species seems to be highly similar to *M. philippinensis*, but it is distinguishable from the latter species in respect to the widely effused hypostromata, less number of bristles and the dimension of ascospores.

Summary

This paper dealt with Japanese species of the genus *Melchioria* Penz. et Sacc. which is a newly recorded genus in Japan.

1. Six species of the fungi have been recognized to belong to the genus *Melchioria*, among which five species were bambusicolous and three were found in Japan.

2. Three Japanese species were fully described in the text, and two new combinations, *M. maeshimana* (Hino et Katum.) Hino et Katum. and *M. philippinensis* (Rehm) Hino et Katum., and a new species, *M. pseudosasae* Hino et Katum., were proposed.

References

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筆者らがさきに日本産として記録した *Gibbera maeshimana* Hino et Katum. および *G. philippinensis* Rehm はいずれも子囊の性質その他から *Gibbera* 属に属するものではなく，Sphaeriaceae 中の *Melchioria* 属に入るべきものであることが明らかとなったので，これらを *Melchioria* 属に移して新組合せを行なった。またこの2種の菌に類似する新種菌 *M. pseudosasae* Hino et Katum. を記載した。*Melchioria* 属は日本では初めて記録された属で6種の菌を含むことになるが，その中5種が竹類寄生菌で，東アジアおよび南米に分布する。

○タタラメという植物（前川文夫）　Fumio MAEKAWA: "Tatarame" identical with *Asarum caulescens*.

新撰字鏡に莘と書いて太太良女と読ましている。大言海は「爐(タタラ)は火の赤いことによるか」といった関係あるのかないのかわからない言葉を出して，タガラシのことで，これには紅白あるが紅い花の方だという。甚だ要領を得ないのは植物を知らずに語源を扱うからである。源氏物語の末摘花の条に「たたらめの花の如(ごと)，三笠の山の処女(をとめ)をば捨てて……」というのがある。近日，久松潜一，志田延義：古代詩歌に於ける神の概念（昭和42，再版）p. 69 をみたら莘とは細辛，ウスバサイシンのことであろうとあったので，これはこちらに関係があると眼をこらしたが，さてウスバサイシンの花の如，処女を捨ててとはどういうことかと頭をかかえた。すると最初の「火の赤きによるか」がピンと来た，というのは，これをフタバアオイだとすると実に打ってつけになるのである。それはこの花は蕾の時じつに濃い赤褐色を呈するが，いざ開花すると急速に色あせて白っぽくなってしまう。それでもはじめてみれば実にほのぼのとした桃色だけれども，はじめの濃い赤を知っている者の眼からみれば全く白く色あせている。フタバアオイは賀茂の祭の神事につかう位，平安時代にはよく知られた草であったろうから，この花色の変化は常識であり，従って多々良女の花の色の如く，搔練（カイネリ）好むや云々の風俗歌にも読みこまれ，また紫式部は当然これも知っていて，文章に使ったものであろう。内膳司式に青草を漬ける時に，多々良比売（タタラヒメでこれが訛ってタタラメとなった）の花の乾したのを三斗も加えて，さらに塩を加えたとあるから，当時この花の利用が何等かの意味をもっていたのであろうが，もしも今どこかにこういう習慣が残っていたら，ぜひ知りたいものである。それからこれは余談だが，フタバアオイの花を乾すとすれば，あの長い茎の末端に出ている花を摘んだに相違なく，さればこそ末摘花の条下に使用したのだとは少々うがち過ぎか。　（東大・理・植物学教室）